

# SUPPLEMENT.

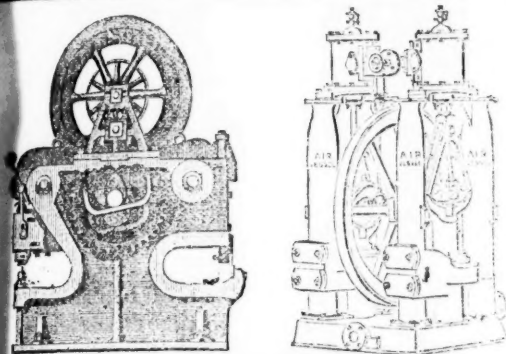
## The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE: FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

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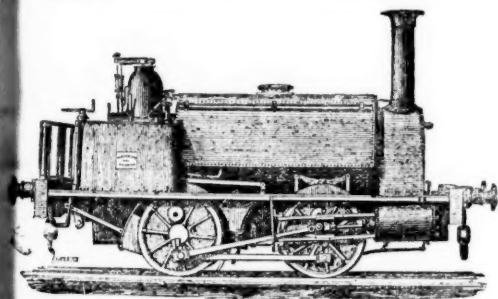
LONDON, SATURDAY, APRIL 4, 1874.

PRICE.....FIVEPENCE.  
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BAR AND ANGLE IRON SHEARS, PUNCHING AND SHEARING  
MACHINES, PATENTEE OF THE DOUBLE CAM LEVER  
PUNCHING MACHINE, BAR SHEARS, AND RAIL  
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HENRY HUGHES AND CO.  
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FOR CONVEYING FIRE TO THE  
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Obtained the PRIZE MEDALS at the "ROYAL EXHIBITION" of 1851; at the "INTERNATIONAL EXHIBITION" of 1862, in London; at the "IMPERIAL EXHIBITION," held in Paris, in 1855; at the "INTERNATIONAL EXHIBITION," in Dublin, 1865; at the "UNIVERSAL EXHIBITION," in Paris, 1867; at the "GREAT INDUSTRIAL EXHIBITION," at Altona, in 1869; and at the "UNIVERSAL EXHIBITION," Vienna, in 1873.

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BANK CHAMBERS, SOUTH JOHN-STREET, LIVER-  
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the largest kind in use, SUGAR MACHINERY, MILLWORK, MINING  
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SECONDHAND MINING MACHINERY FOR SALE.  
In First-Rate Condition, at MODERATE PRICES.  
PUMPING ENGINES; WINDING ENGINES; STAMPING ENGINES  
TEAM CAPSTANS; and CRUSHERS of various sizes. BOILERS, PIT  
WORK of all descriptions, and all kinds of MATERIALS required for  
MINING PURPOSES.

THE PATENT PNEUMATIC STAMPS  
may be SEEN AT WORK at HAYLE FOUNDRY WHARF, NINE ELMS,  
by previous application at either of the above addresses.

GREENE AND ELLIS' IMPROVED FETTLING FOR  
PUDDLING FURNACES is now in active operation at the SKERNE  
WORKS, DARLINGTON, and LICENSEES may be had for USING the  
FETT on application to T. GREENE, STATION STREET, DARLINGTON.  
The improved yield and quality of iron produced, and the economy effected by  
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cessity and certainty.—Darlington, January, 1874.



PARIS.



ORDER OF THE CROWN OF PRUSSIA.

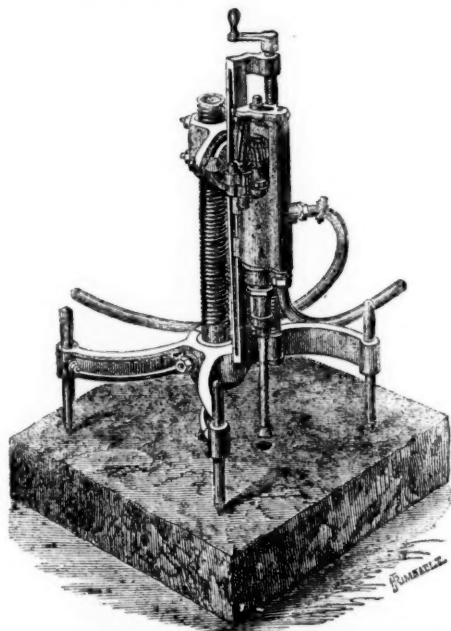


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### McKEAN'S ROCK DRILL, ADAPTED TO EVERY CLASS OF ROCK BORING.

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MINES, TRIESTE HARBOUR WORKS, ALEXANDRIA  
HARBOUR WORKS, AND IN VARIOUS TUNNELS,  
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- 2.—No duplicate parts whatever require to be furnished with machines.
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PORTABLE BOILERS, AIR COMPRESSORS, BORING STEEL,  
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This PATENT APPARATUS is EXCEEDINGLY SIMPLE and INEXPEN-  
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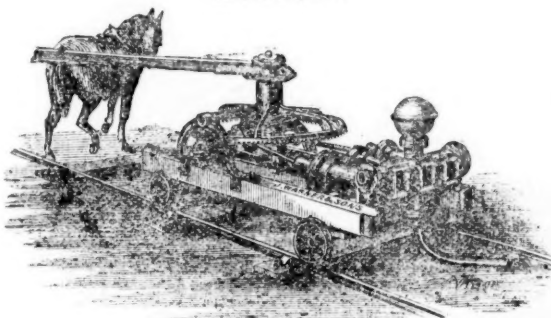
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BELL AND BRASS FOUNDERS TO HER MAJESTY,

Crescent Foundry, Cripplegate,

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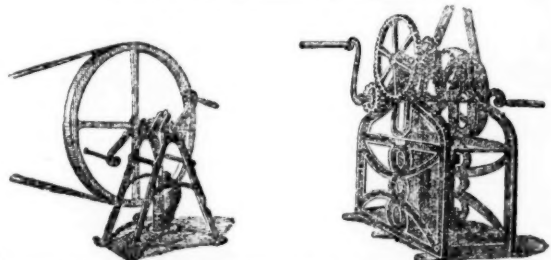


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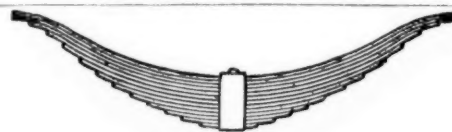
Price Lists and Testimonials upon application.



PUMPS OF EVERY DESCRIPTION, for hand, horse, steam, wind,  
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Full HYDRAULIC CATALOGUE upon application.

VIENNA EXHIBITION, 1873. See Award List.—TWO MEDALS  
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### RAILWAY SPRING COMPANY,

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### ROCK DRILLS.

#### DIFFERENT SYSTEMS.

**THE ANTI-CONCUSSION DRILL.**—This machine is specially adapted for driving levels, adits, or tunnels. It works without concussion, and therefore does not wear out. Has driven as much as 53 yards of drift in one month, where hand labour could only progress 8 yards in the same time. Forty-four of these machines are at work in a single colliery. Price £105.

**THE EXCELSIOR.**—This machine is the latest out; it is self-acting, self-feeding, self-stopping. It has fewer parts than any other drills, and its simplicity is remarkable. It is specially adapted for sinking and vertical work. Price £85.

**THE QUARRIER.**—Self-acting and self-feeding, very light and handy, suited for general work, and for quarry work, especially on account of its very small dimensions and lightness. Price £60 to £80.

**THE HAND DRILL.**—Hand drill for soft material. Price £20 to £24.

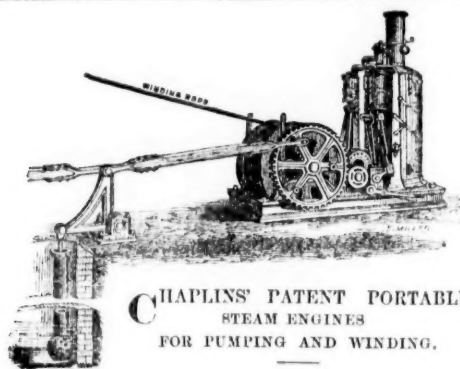
**DRILLS** of other systems are also in stock, and can be supplied, if desired.

Each of these Drills is a different Patent, constructed on a separate and distinct principle.

Messrs. CHARLES BALL and Co., in consequence of their long experience in Rock Drilling, both in England and on the Continent, are prepared to advise professionally as to the best methods for driving and sinking according to nature of rock and local circumstances.

Should other ROCK DRILLS or MINING MACHINERY be successfully brought out by practical Engineers, Messrs. C. BALL and Co. are prepared, after having had the invention thoroughly tested, to enter into arrangements with the Inventors for the INTRODUCTION of such MACHINES in this Country and Abroad.

Progress obtained by CHARLES BALL and Co.'s DRILLS at the Collieries of Ronchamp:—  
By hand - - - - - 8 yards per month.  
By Charles Ball and Co.'s Machines - - - - - 53 yards per month, or 6½ times as fast.



These ENGINES are specially adapted for pits, quarries, &c. They are exceedingly simple in arrangement and strong. No foundation or chimney stalk being necessary, they can be erected or removed with very little trouble or expense, and are well adapted for home or foreign use.

Sizes, from 2 to 25-horse power.

STEAM CRANES, STEAM WINCHES, CONTRACTORS' LOCOMOTIVES, HOISTING ENGINES, PUMPING AND WINDING GEARING, &c.

ALEXANDER CHAPLIN AND CO.,  
CRANSTONHILL ENGINE WORKS, GLASGOW.

THE PATENT SELF-ACTING MINERAL DRESSING  
MACHINE COMPANY (LIMITED).

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OFFICES, -62, ST. VINCENT STREET, GLASGOW.

#### IMPORTANT NOTICE TO MINE PROPRIETORS.

This company grant licenses, under their patents, for the use, singly or in combination, of the most approved machinery for dressing ores, comprising Stamp Jiggers, Classifiers, and Buddies.

**MR. GEORGE GREEN**, Mechanical Engineer to the above Company, SUPPLIES MACHINES under the above Company's Patents for DRESSING all METALLIC ORES. Dressing floors having these Machines possess the following advantages:—

- 1.—They are cheaper than any other kind in first outlay.
- 2.—From 60 to 70 per cent. of the labour is saved.
- 3.—Only about one-fourth of the space usually occupied by dressing-floors is required.
- 4.—The ore is made clean at one operation, and 5 per cent. of ore otherwise lost is saved.

Drawings, specifications, and estimates will be forwarded on application to—  
GEORGE GREEN, M.E., ABERYSTWYTH, SOUTH WALES.

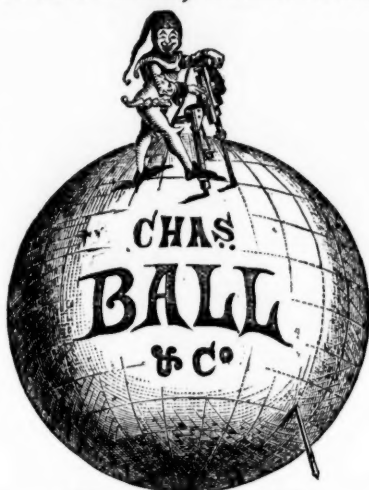
#### EXTRACTS FROM TESTIMONIALS RECEIVED:—

**Mr. C. E. BAINBRIDGE**, of the London Company's Mines, Middleton-in-Teesdale, by Darlington, writing on the 27th September, 1873, says:—"After a full season's experience of the very complete Dressing Machine erected by you at our Colberry Mines, we are fully satisfied with our decision to adopt your patents in preference to all others. The machinery does its work as well as we can desire, and better than we anticipated. We are now getting through 70 tons of orestuff per day, of rich quality. Without your machinery we should have been at a standstill, for we cannot get hands to supply our wants elsewhere. It saves fully one-half of the old wages, and vastly more on the wages we now give, and the saving in ore is not much short of 10 per cent. You can quote from this letter as you think proper."

**Mr. COULTAS DODSWORTH**, of Haydon Bridge, writes, on the 15th January, 1874:—"I have just returned from the Stonecroft and Greyside Mines, where I have seen your 'Patent Ore Dressing Machinery' at work, with which I must say, I was highly pleased. It is decidedly the best machinery I have ever seen for the purpose, the results being as near perfection as possible, and I am quite sure its use in this case will be a very great saving to the company. No large mining establishment should be without your machinery, especially when labour is difficult to procure—a mere fraction of the hands being only required as against the old system, and the work all together much better done, and a great saving of ore effected. I have heard it said that your machinery is better adapted for poor than for rich ores, but from what I have seen to-day I am quite confident it will do for any kind of ores. I beg not only to congratulate, but also to compliment, you on the great success of your 'Patent Ore Dressing Machinery.' You may use this letter as you think proper."

**Mr. MONTAGUE BEALE**, Managing Director of the Cagliari Mining Company (Limited), says, on May 15th, 1873:—"I have much pleasure in speaking of the great efficiency of your 'Patent Dressing Machinery,' as erected by you at our mines at Rosas, in the Island of Sardinia. You will remember it has always been considered impossible to dress, or rather separate, the minerals our ores contain by machinery, but our captain assures me he gets a constant return of 76 per cent. of lead with the greatest ease, and I know by the returns we are realising the best market price. I consider this company is much indebted to you for the success you have achieved at so small cost. It may interest you to know, from my experience in several of the British possessions, including the whole of the Australian Colonies, that my opinion is I have never seen any dressing machinery that can efficiently, and at so small a cost, dress, and separate metallic ores, however close the mechanical mixture may be, as yours. You can use this letter in any way you like."

The most satisfactory testimonials also have been received from the GREENSIDE MINE COMPANY, Westmoreland; the TALARGOCH MINING COMPANY, North Wales, and others. Copies of these may be had from Mr. GREEN.



REGISTERED TRADE MARK.

### AIR COMPRESSORS.

**DRY SYSTEM.**—Cheap and simple—six sizes.

**WET SYSTEM.**—This plan of compressing air is so perfect that the volume of the air compressed is equal to 96 per cent. of the volume of the cylinders. It is recommended whenever the work is of a permanent nature, or likely to be protracted. Driven by steam direct—nine sizes. By water power or straps—six sizes.

### BOILERS.

**SMALL BOILERS**, for working Rock Drills, from 4 to 12-horse power generally in stock,

ANY LARGER SIZE TO ORDER.

**PUMPS, STONE BREAKERS, WINDING ENGINES, &c.**

ESTABLISHED 1860.

FIRST BRATTICE CLOTH AND AIR TUBING WORKS ESTABLISHED IN WALES OR SOUTH OF ENGLAND.

## GOVERNMENT FIRE-PROOF BRATTICE.

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MAJESTY'S INDIAN GOVERNMENT.

## BRATTICE CLOTH!!!

PERFECTLY AIR-TIGHT AND ANTI-ROT PROOF.

**DOOR CLOTH.** Doors made to any size, with Brass Eyelets.

**FLEXIBLE AND IRON AIR TUBING**, any size or diameter.

HORSE COVERS, TARPULINS, &c.

Manufacturer of **LOCOMOTIVE and WAGON GREASE; TRAM OILS and VARNISHES; WIRE ROPE and ANTI-FRICTION GREASES.**

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**THE GREEN, NEATH, GLAMORGANSHIRE.**

AGENTS: W. H. HAIGH, CAMP STREET, ASHTON-UNDER-LYNE; G. F. ARBLASTER, CANAL PARADE, NEWPORT.

PORTABLE,

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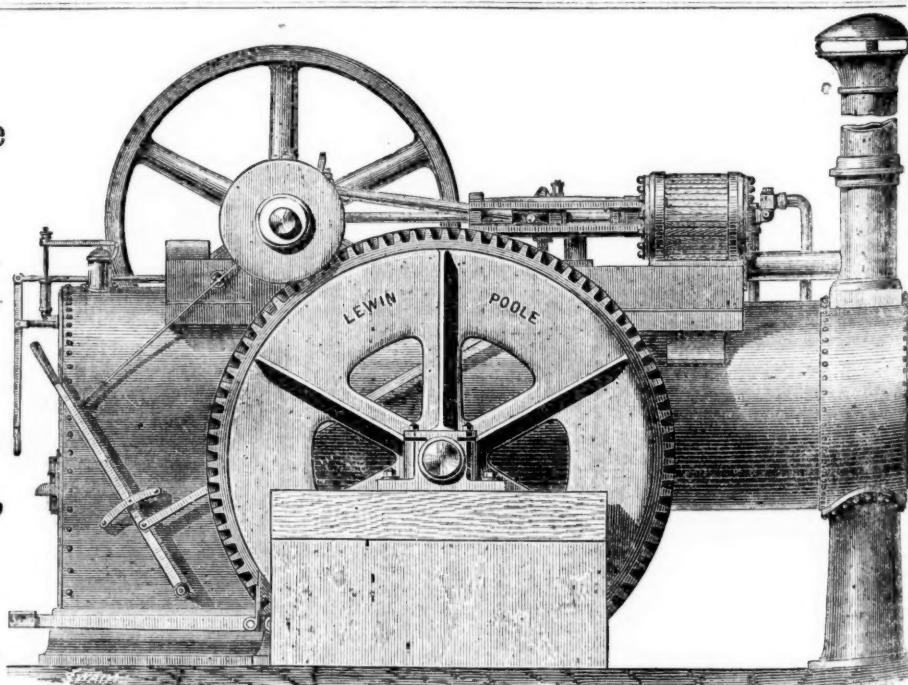
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Saw Benches.



## WINDING AND PUMPING GEAR.

For catalogues and particulars, apply to—

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CHARLES PRICE AND CO.'S

## PATENT RANGOON ENGINE OIL.



THIS OIL is suitable to every kind of Machinery; it is used almost exclusively in Her Majesty's Dockyards and Fleet, and by the War Office and East India Government; as well as by the Royal Mail Steam Packet Co., Pacific Steam Navigation Co., P. and O. Co., Cunard Co., and by most of the other important Royal Mail Steam Fleets in the kingdom. It is also extensively employed on the various railways, and by many of the leading engineering and manufacturing firms at home and abroad.

"I hereby certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is calculated, indeed, to protect metallic surfaces from oxidation, and, from its peculiar character, is not liable to lead to spontaneous combustion of cotton waste or any similar material which might become imbued with it, as is the case with Rape, Gallipoli, and Olive Oils. The lubricating power of this oil is equal to Sperm or Lard Oil."

T. W. KEATES, F.C.S., &c., &c., Consulting Chemist to the Board of Works.

Extract from Mr. BAXTER'S Speech in the House of Commons, May 31st, 1870:—  
Chas. Price and Co.'s Rangoon Oil—"a vastly superior article" (speaking of Gallipoli Oil at £72 per ton)—"was obtained for from £40 to £45 per ton."

Every parcel of the Oil sent from the Works bears the Trade Mark of the Firm, and as many spurious imitations of the Rangoon Engine Oil are sold purchasers are requested to observe that none is genuine which does not bear this mark.

Oil, Tallow, and Colour Merchants, Seed Crushers, Turpentine Distillers, &c.

London: CASTLE BAYNARD, UPPER THAMES STREET, & MILLWALL, FOPLAR—Works: ERITH, KENT.



## Original Correspondence.

## THE MINES AND MINING DISTRICTS OF UTAH.

## THE DISTRICTS OF THE WAHSATCH RANGE.

**BIG COTTONWOOD MINING DISTRICT** is situated in Salt Lake county, adjoining Little Cottonwood on the north, and Parley's Park on the east, about 22 miles distant from Salt Lake City in a south-easterly direction. It is accessible from the city by the Utah Southern Railroad to Sandy station, thence by stage up Big Cottonwood Canyon, and also from Little Cottonwood Canyon across the divide, which route in winter is the most convenient means of access to a number of the principal mines. Big Cottonwood, in common with several other districts in the Wahsatch range was formerly a part of the old mountain lake district; but in 1868 it was organised into a separate district, and now contains about 700 locations. It is about 10 miles long by 6 miles wide, and consists of South Fork, Day's Fork, Kesler's Peak (a very high rocky ridge), Silver Fork, and Honeycomb Canyon, which may be termed merely spurs from the main canyon. The district has an abundance of timber and good water, and the scenery up the canyon is considered the wildest and most romantic in Utah, some of the views being not surpassed in any location on the western continent, not even in the far-famed valley of the Yosemite.

The geological formation is generally similar to that of Little Cottonwood, consisting principally of granite, quartzite, and limestone, the latter predominating. There seems to be one great belt of the same formation extending south to American Fork, the veins in each district, however, being entirely dissimilar in their main characteristics. This belt contains one continuous series of mining locations, already numbering several thousands, and within a few years will probably number thousands more. A number of the principal Big Cottonwood Mines are located on the ridge of mountains which divide Big from Little Cottonwood. These dividing mountains run in nearly a north-westerly and south-easterly direction, with spurs leading to the north, between which flow several small creeks or streams forming branches of, and running into, Big Cottonwood Creek. Though separated by only a single ridge of hills, the mineral veins of these two districts are totally different in character, and on an average valuation the ores of Big Cottonwood Mines, thus far, have proved to be very much the richer of the two. The ledges of the prominent mines in the latter district have, in almost all instances where development has been prosecuted to any depth whatever, been proven to be true fissure veins, while those in Little Cottonwood are generally strata veins, and the ores carry a large percentage of silica, while the ores of the best mines in Big Cottonwood carry a very small percentage of that article, if any at all. There are two distinct belts of mineral in this district, and the ores are principally argentiferous galena and carbonates of lead carrying silver, with decided traces of antimony and arsenic. Gold has been discovered in small quantities in some of the gulches, and one mine was worked with considerable success a year or two ago. A few garnets have also been found, and some specimens of tourmaline which were almost equal to emerald. It will not be strange if other precious stones should be discovered in time, as this district is undoubtedly a very rich mineral location.

The mines in Big Cottonwood are not so numerous as in Little Cottonwood, and for various explicable reasons their development has been extremely slow; but they are likely to be permanent and sure. There has been a great deal of money expended, but it has been by individual mineowners, and not by companies having a large working capital, and the obstacles were formidable that had to be overcome before the mines could be worked to any advantage whatever. One instance of what had to be accomplished before the mineral could be made available is given in the following description of the celebrated Reed and Benson Mine.

The Reed and Benson Mine, one of the most valuable in Utah, was discovered in the spring of 1870, and is located on South Fork, near the summit of the divide between Big and Little Cottonwood, about half a mile in a direct line from the Flagstaff Mine in the latter district. It is situated at an altitude of nearly 9000 ft. above sea level, the highest location known in Utah; and its inaccessible location has rendered it necessary to spend a large amount of money before the mine could be worked to any profit or advantage, and its rich mineral turned to any account. Great credit is due to the owners for the perseverance and courage exhibited in prosecuting the vast enterprise, which proves the unbounded confidence they possessed in the value of their property. Roads had to be built over the mountains at great cost and labour, trials made around almost impassable bluffs, where in drilling and blasting it was necessary to suspend the workmen by the strongest ropes, and by iron chains in some instances; and a tunnel 300 ft. in length had to be run through a formation of limestone, silica, and trap, or what is commonly termed porphyritic blende rock, and a tramway 1600 ft. in length has been erected, which passes over an almost perpendicular bluff 400 ft. in height. This tramway is well covered the entire length, so as to avoid any delays or annoyance from snow storms, and is without doubt the most perfect and costly arrangement of the kind ever built in this or any other country.

The developments of this mine consist of several shafts and inclines, and a tunnel 600 ft. long connecting with an incline 131 ft. in length; both the tunnel and incline are well laid with a 26 in. gauge iron track which connects with the tramway. The main shaft and incline are 380 ft. deep, and the total explorations are over 600 ft. in depth, and the other developments in drifts, inclines, levels, and shafts are more than 3000 ft. in length. There are at present 50 men employed in the mine, and from 6 to 10 tons of ore raised daily; but by spring 125 miners will be employed, and it is intended to place a steam-engine in the tunnel to intersect with the main shaft, which will do the work of the whole mine, when 100 tons of ore per diem will be raised. The main formation of the mountain is limestone and silica, and is a regular stratified formation, the vein cutting the lime stratum at a vertical elevation of 1300 ft. above the valley. The lime stratum continues to the east wall of the lode to the depth of 600 ft., and 650 ft. in length, while the hanging wall is perfectly regular and unbroken for the same distance, and carry a very large percentage of silica. The vein has been pronounced a true fissure, cutting the strata, and joined at a depth of 600 ft. from the surface by two strata veins, where an immense chamber of ore was discovered. From the surface to the depth of 150 ft. the ore and vein average 15 ft. in width, while the vein now being worked at a depth of over 600 ft. averages 60 ft. in width, proving conclusively that as the mine is developed in depth the body of mineral constantly increases, and will continue to do so until the main floor of the mine is reached. The ores are argentiferous galena and carbonates of lead, averaging in assay \$80 per ton in silver and 45 per cent. in lead.

The most extensive and commodious buildings are attached to this property, consisting of store-rooms capable of holding 20,000 sacks of ore, large ore floors, assay office, blacksmiths' shop, superintendents' quarters, buildings covering the ore dump, and living apartments for the comfortable accommodation of 10 men, all finished in a thorough and substantial manner. Very complete and expensive arrangements were made at the commencement of the present season for working the mine all winter; and it is expected that ore will be shipped during the entire year without any cessation. There is plenty of good water, and an abundance of timber in the vicinity of the mine, and the mining law of the district has been amended to agree with the United States Mining Act of 1872, giving to each locator 300 ft. on each side of the lode. The cost of the present inside developments and outside improvements on the Reed and Benson Mine is over \$150,000, and surpasses the improvements on any mine on the Cornstock lode, and are equal to any in the United States. The property is owned by Henry C. Goodspeed, F. Reed, and others.

The Highland Chief Mine was discovered in September, 1870, and is situated in Silver Fork Canyon, on the south-westerly slope of a mountain, which is the divide between Silver Fork and Honeycomb Canyons. The claim contains 1200 linear feet, and consists of lead ore carrying silver. It has been worked almost continually since its discovery, and large quantities of ore have been taken out, and there are large quantities now in sight. The developments consist

of a tunnel, 400 feet long, and 400 feet of shafts, drifts, and levels. The country rock is limestone, and the vein matter about 2½ feet wide, the ore averaging in assay \$155 per ton in silver and 60 per cent. lead. Four or five tons of ore are raised daily, but this is simply in the work of developing the mine, and when the works are complete a much greater quantity will be raised. There is a good boarding-house attached to the property, and a building over the entrance to the incline. The mine is owned by Allen Schenck, N. W. Mundy, and J. P. Page.

The Wellington Mine is situated in Silver Fork Canyon, near the Highland Chief, and is owned by the same company. The improvements consist of two levels, each driven in 120 feet, two shafts, 230 feet deep, and 100 feet of stops. A level is now being driven to connect it with the first shaft of the Highland, 224 feet of which is already completed. There are seven men employed this winter, and 3 tons of ore are extracted daily, averaging in assay 96 ozs. of silver per ton, and 51 per cent. of lead, besides large quantities of lower grade ore, which are passed in working the mine. The Boston Tunnel is intended to tap both the Highland Chief and Wellington Mines, and is now in about 114 feet. The vein of the Wellington will be reached at 250 to 300 feet, and the Highland Chief between 800 and 900 feet. This tunnel is intended to be 1000 feet long, and the present estimated cost of expenditure is nearly \$75,000. Early next spring active operations will be commenced on all this property, and 50 men will be employed. The Highland Chief has been surveyed for United States patent, which has been issued.

The Sailor Jack is situated on the western slope of Kesler's Peak, and is located on the same mineral belt as the Reed and Benson. The lode has been worked almost continually since its discovery, and the developments consist of a discovery shaft, 12 feet deep, with a drift of 48 feet to the east at the bottom of the shaft. Above this drift a large cave was struck, containing large quantities of very rich ore, assaying from \$150 to \$350 in silver, and 70 per cent. in lead. From the bottom of the drift is a shaft, 115 feet deep, cutting a fine vein of ore, averaging 2 feet in width, and from this shaft is a drift to the west of 65 ft., which strikes the surface of another claim. A tunnel has been run some 70 ft. long, and in addition there is a good deal of surface excavations. The formation is quartzite to the south, and limestone to the north, the character of ores in galena and chloride assaying from \$40 to \$100 per ton on a general average. A large quantity of ore has been shipped during the past summer, and there is now about 50 tons on the dump. An abundance of fine timber exists in the vicinity, and there is a good trail leading from the mine via South Fork of Big Cottonwood. A United States Patent has been issued for the property, which is owned by A. K. Smith, B. A. Froiseth, U. S. Surveys.

[To be continued.]

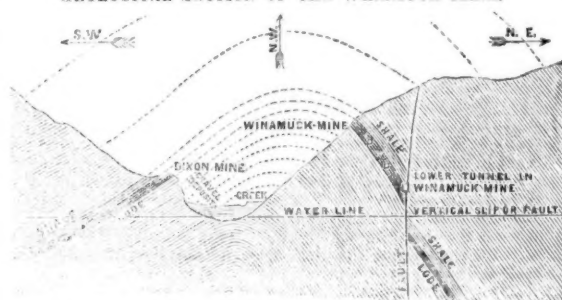
## MINING IN UTAH—SLIDES OR FAULTS.

Sir,—I forward you a second illustration, this time by Professor Clayton, taken from the *Utah Mining Gazette*, of the occurrence of slides or faults in the veins of Utah, and how easily they are found again; and in most cases the veins produce by far richer ores than they did after passing these faults. The directors of the Emma, as well as the "Bears," are making capital out of this temporary discontinuance of ore in the deepest workings. If shareholders had only had an idea of the state of things as represented in my recent diagram I am certain that few shares would have been sacrificed, and less so if they had been informed that, although the ore was cut off down below in the deepest point in the mine by a new fault, they would have been easily convinced that the mine was looking well between the two faults, having 3400 tons of rich ore as reserves. In the old workings above two bodies of ore were found—that of the Emma proper, and the one that was drained by the Illinois Tunnel. Here we have, therefore, another practical proof that there is every probability of the ore not confining itself to one body of only 110 feet in length between the two faults. Why should such information have been withheld from the shareholders? Simply because the directors foresaw that the shareholders would then have exercised the plainest common-sense, and have had tangible proofs that the Emma Mine is in a better condition now than when she was paraded as having \$4,000,000 reserves. I am modest, and not greedy; in my estimates of the reserves I only pretend that there exist about \$400,000 to \$500,000 discovered to date, and that a second ore body exists somewhere, as was the case above, in the 2290 feet of length of unexplored ground in between the two slides.

Salt Lake City, March 7.

Fair-Play.

## GEOLOGICAL SECTION OF THE WINAMUCK MINE.



This section shows the curvature of the lode and associated beds at right angles to the longitudinal axis of the upheaval. It also shows a fault or slip of the lode and country rock on the right hand or eastern flank of the anticlinal curvature. This slip or fault has been met with in the lower tunnel, and also in the next level above, called the windlass drift. The extent of this fault is not yet determined by the explorations, but is supposed to be approximately as shown in the section. The indications are that the fault is not great at the base of the hill near the canyon, but becomes much greater as you go south-west, towards the centre of the hill.

## ANGLO-FRENCH RAILWAY COMMUNICATION.

Sir,—I have carefully and calmly read the article under the above heading in the Journal of March 21, and am at a loss to understand the motives and intentions of the writer, knowing, as I do, the favourable opinions which have been so often expressed in the *Mining Journal* in former articles on the project of a "Submarine Tunnel," and particularly so in recording my ideas and plans from time to time since 1856. I am the more surprised to see and read this great international project is now described in the recent article as an "irrepressible mutuality" in one place, and as "a flue" in another. When by nearly the whole mass of the press, and the practical men of civil engineering, it is every day admitted that "there is an urgent necessity for connecting England with the Continents, and particularly with India, by continuous direct railways, passing through European and Asiatic continents, and finally extending across the Behring Straits, by tunnel, into the American continents." (See my letter referring to this subject in "Society of Arts Journal," March 27.) It must, and will soon be recognised and adopted, and I most sincerely hope that the very best designs and methods will be selected by the proper authorities, for practically accomplishing this truly national work, which will ultimately prove to be the key to the whole civilised world of commerce. I will not waste time nor space to go into the details of Mr. G. Remington's project, which are very vague and contradictory; nor will I admit that Weald clay is any better than London clay or chalk for driving a submarine tunnel excavation safely through it; they will each and all of them let the sea water rush into the tunnel. The Gault clay alone is the only reliable stratum fit for the great work.

This belt of Gault clay crosses from Eastware Bay, Folkestone, to the French coast, between Wissant and Cape Grisez, by an easy curve. Another similar belt of the same valuable clay crosses the Channel from Beachy Head, near Hastings, to Dieppe, in France, and would be equally available for a submarine tunnel if the distance apart

from shore to shore were not so great. That Mr. G. Remington could construct 33 miles of sub-marine tunnel for five and a half millions sterling I cannot admit, especially as he stated seven millions sterling in an estimate seven years since, and materials and labour have both increased in value, and not decreased. Similarly understated and underrated are the quantities and prices miscalculated for the great mass of continental traffic to and from England, and for which a single one-arched tunnel, with a double line of rails, will never suffice, any more than a single street or road would take all the concentrated vehicular traffic of London through it daily.

With a triple-arch tunnel, such as I have proposed and submitted to the public since 1856, separating fast, slow, and goods trains from each other, space and safety will be secured for the great traffic requirements, and which latter, I feel assured, are more likely to be under calculated than otherwise, but will, by judicious arrangement and reduced working expenses, bring in a handsome profit to investors, despite all the abuse, ridicule, miscalculation, and contradiction which have been so liberally showered down upon this great project by those who do not or will not allow it fair way and progress. Finally, I can assure the writer of the article in question that the important subject of international communication is fully appreciated and understood in Paris, Berlin, Vienna, &c., and France will be most benefitted by the great stream of commerce flowing through it. There are plenty of capitalists on both sides of the Channel ready and willing for the work—as were found for British railway outlays, amounting to a sum of 575,000,000 sterling—and an outlay of 25,000,000 sterling for a triple arch, submarine tunnel and railways, will not frighten or deter them, nor will they require monarchical or governmental aid to complete and carry forward the great works when once the decision is given as to where, when, and how it shall be done for the advantage of all concerned on both sides of the Channel.

W. AUSTIN, C.E.

Dartmouth-terrace, Bermondsey Park, March 30.

## COAL.

Sir,—Your correspondent "Pick" has endeavoured to show a large amount of mystery and deception where none exists. He asks, "If I order Hettons, Hartleys, Double Diamonds, or Earl Fitzwilliams Eleasers, how am I to know that I do not get Bright Derby, or Talk-o-th-Hill, instead thereof?" Now, if his purchases are made 14 lbs. at a time he has perhaps no remedy; but if he will "prepare for a rainy day" to the extent of saving money during summer, in order to be enabled to buy in large quantities—say half-a-ton at a time—at the commencement of winter he will have no difficulty in the matter, since he need only read (I presume he can do so) the delivery ticket, which is always presented before the coals are unloaded, and to falsify which would subject the seller to very heavy penalties.

In his professed inability to distinguish between the several kinds of coal called Wallsend, with various prefixes, "Pick" tries to create mountains out of mole-hills in the same way, and if he will trouble himself to learn a little more law, he will find that the dealer in coals cannot sin with impunity any more than Pick's "humble grocer."—March 30.

N. F.

## COAL MINES REGULATION ACT.

Sir,—In the Journal of last Saturday I see reference made to examinations for certificates of competency in connection with a previous communication on the subject from the secretary of the Derby, Warwickshire, &c., Board of Examiners. If the communication referred to has any truth, I should like to know what is the use of holding any examinations at all? A set of questions are to be formed which may be regularly given for succeeding examinations. I must say I never yet heard of such a ludicrous manner of conducting matters. Is this the way Government intended these examinations to be carried out? or is it that the emolument paid to examiners is not sufficient to remunerate the trouble in preparing fresh questions for each examination?

From experience I can only say candidates, upon seeing such a statement, would leave no stone unturned to become acquainted with the questions. Some of the examiners, or the secretary, should get a student of any college, or one who has gone in for any examination, civil or military, to give them the rule and custom upon this point, and he will soon see how very absurd it would be to proceed as intimated. No! let the questions be published, as whatever chance there is of managers attaining the confidence of their employers by the latter being able to understand what their attainments are, there is none when they consider it was only necessary that they should have known a previous candidate, or to have gone up a second time in order to be fully prepared with 100 per cent. of marks.

I am not an advocate of competitive examinations for any such purpose; but let these be done openly with a certain number of marks for qualifying, and each candidate's numbers be stated, which would give an impulse to the several candidates.

A CERTIFIED MANAGER (with competency).

## SILKSTONE FALL COLLIERY COMPANY.

Sir,—Permit me to reply to a letter in your valuable Journal of last week, and signed a "City Merchant." This person shows himself quite ignorant of the requirements of the Joint Stock Companies Act, which does not leave it to the option of the "chairman or other official" to reject proxies when sent to the registered offices in accordance with the Act. Every shareholder had notification of the above on the proxy sent him, and consequently the remark about sending proxies "blindfold to the chairman, or other official" fails to have the venom intended. The Act, and also the Articles of the company, not having been complied with in the case of Mr. Kimber's proxies, they were rendered illegal. He was not elected a director. I would also intimate the proxy signed by the "City Merchant" was not dated at all, showing his ignorance in the matter, and that he was prompted by an interested person. The many proxies mentioned by "City Merchant" amounted to three out of 270 shareholders.

1, Field-court, Gray's Inn, April 2. CHAS. MINSHULL, Sec.

## MINERAL WEALTH OF PEMBROKESHIRE.

Sir,—It may be pleasing to some of the numerous readers of your valuable Journal to learn that the extension of the Whitland and Tawe Railway, from Llanfyrnach Station to the Crymch, or Cardigan Road, Station has been completed, and is open for traffic. Since the line was opened to the above station last year the traffic in lime, coal, culm, cattle, and pigs has been something marvellous; it is nothing unusual to see 40 or 50 carts a-day at the station, and there is every probability that the traffic will be considerably increased at the Cardigan Road from the extensive tract of country surrounding it. This line will also reap great benefit from the Old Llanfyrnach Silver-Lead Mine, which it passes in close proximity, also the extensive slate and flag quarries at Glogue; that young mine of Fronlwyd, progressing so favourably, will ere long pour its treasures on to the lines; the mineral veins on this extensive sett are numerous. Recently, a strong lode was met 1 ft. from surface, 2½ yards wide, which the captains of the old mine pronounced to be a continuation of their great gossan lode so productive with them. A few days since another lode was costained upon, 4 ft. from surface, showing good lead; it appears the adit, 20 fms. below surface, according to Capt. Morris's calculation will very soon intersect a copper lode driving upon. In the railway cutting several lodes were passed. The opening of this line should induce capitalists to enter North Pembroke, where extensive mineral deposits await development.

A few weeks since I read in the Journal Mr. Adams' report from Sydney, New South Wales, lamenting bitterly the apathy shown by capitalists and proprietors in not developing the hidden wealth of the colony, and particularly noticing an immense rock of alum, which could be put on board ship at 6s. per ton. Now, Sir, nearer home, neglected Pembroke, amongst other varied mineral deposits, can produce thousands of tons of alum shale on the sea-shore near deep water, and could be put on board for less than half the above sum, and thankful. It is curious to observe on a hot summer the crude alum covering the rock, from which pounds could be swept off in a short time, but there it rests. Near this a copper lode passes under the sea. Some few years ago a strange phenom-



non occurred here; by the removal of many acres from an incline to a horizontal position, caused by the gas from below, the writer was cognisant of a copper lode at surface, which this upheaval rendered dangerous to work. Pembrokeshire is worthy of being looked over; veins crop out in all directions. There is not the least doubt shallow workings will be the result, and prove highly remunerative. The Old Llanfyrnach commenced paying from a very shallow depth. It is truly lamentable to read the great loss of English capital that has occurred in mining in distant countries, AMATEUR.

#### THE FUTURE OF MINING.

SIR,—There can be no question that mining enterprise is second to none, save agriculture, indigenous to our favoured isle. The coal and iron productions are the basis of our trade, commerce, manufacture and wealth; yet the higher valued metals in respect to price per ton—as, for instance, copper, tin, and lead—are those to which we shall now especially refer to. Copper mining in Cornwall has wholly collapsed. Whatever ore of that metal is now raised is associated with losses to the miners; and in respect to tin the deep and expensively wrought mines may shut up shop as soon as practicable, for their palmy days are gone for the residue of this generation. Great Vor, North Roskear, North Crofty, Seton, Margaret, Providence, Botallack, Owles, Basset, South Frances, West Frances, St. Just Consols, East Caradon, West Caradon, Phoenix, and Buller, where are your dividends gone to? and when will you declare another from actual gains over costs of production? Yet there are many young tin mines that possess peculiar and exceptional merits, even at ruling prices of that metal, and will, in all probability, enter the Dividend List during the present or ensuing year. To these we would direct the attention of our investing readers, as they can be purchased at prices far below their inherent and prospective worth. The lead mines are in a most satisfactory position, and large are the gains divided among the numerous proprietors, while many progressive undertakings hold forth promise of early and substantial success. Cardiganshire, Montgomeryshire, Shropshire, Denbighshire, Derbyshire, Yorkshire, Flintshire, and Cumberland each and all contribute their riches to the hands of the wealthy, while the enterprising and practical miners who study the laws of nature and economical expenditure grow daily in repute and opulence.

It is consolatory in these days of Cornish tin mining depression, caused chiefly through panic incipient to the large importations from Australia, and not poverty in our home productions, that recent discoveries on the Dartmoor prove that tin is indigenous to the granite range of hills east, as well as west, of the Tamar. Hence a new and extensive field of shallow mines can be opened out at comparatively trifling cost, and these can be worked with good profits, even should metallic tin recede to 80*l.* or 85*l.* a ton. The rumours long in circulation of heaps of paying halvans and of rich deposits of tin up close to surface have engrossed the attention of several practicals, yet it falls to the lot of Mr. Comyn, of Threadneedle-street, to be the first upon the *tapis* with a tangible, carefully selected, and tested property, situate near Prince's Town, and comprising an area of about a mile square. The specimens exhibited are from several veins, and exceeding rich. Costs of working will prove light, and returns immediately be made—hence we trust that this important shallow and all but established success at "Binda" will receive the support that its merits deserve. The management of New Dolcoath having passed into the hands of Capt. R. Pryor, it is to be hoped that he will soon render a dry mine (so favourably situate, and possessing so many productive points upon which his skill can operate) not only a paying but a dividend property.

Bampfylde shares are an exception to the general depression, for they have been in great request, and large transactions have transpired. The first dividend of 10 per cent. was declared in October last, while a second of equal amount will be declared at the half-yearly meeting to be held on April 2, thus dividing 20 per cent. for the year. The development of this property has proved, as we long since prognosticated, the prize of the period. The directors announce in the balance-sheet a cash credit of 6970*l.*, while the ores—copper, manganese, and iron—are valued at 16,000*l.*, dressed and undressed, and remaining unsold, yet broken and raised to the surface. The workings are highly productive and remunerative, while several pioneer points of operation fraught with promise will soon become achieved.

At St. Agnes Consols the prospects are most encouraging, and there is strong promise of early good results. There has been considerable time and money, coupled with practical economy and judgment, displayed in the development of this property. The secretary takes a lively interest in the welfare and success of the enterprise, while he is liberally supported by an extended and powerful proprietary. At Wheal Kitty, which adjoins, the returns compare favourably with the costs of production, and as the reserves are considerable, it is likely that these two mines will long maintain their prominent position in public favour.

Llanrwst shares are in good demand, and, as we have previously drawn attention to this property, we are pleased to learn that the directors and chief shareholders are so well satisfied with the rapid and successful development of the lodes that a large party are about to visit the works, after which a detailed and thoroughly reliable report will be published. This is one of the many promising and encouraging lead mines now upon the *tapis* likely hereafter to acquire a prominent position, and at the same time to reward the enterprising and spirited proprietors.

At the close of 1872 I predicted that Van would be at the top of the tree for the year 1873, and it is a fact worthy of notice that for the first quarter of the current year the dividend has been 15*l.* per share, so that in all likelihood this mine will cap the List for the year 1874 as well. The reserves are large, the profits over 50 per cent. of yield, and the points of operation continue to develop large masses of lead ore. At Aberdunant, Capt. Knapp and Williams, the latter manager of the Van, speak favourably of the prospects. The lodes are identical in the two mines. The one is discovered at Aberdunant, and so sanguine are the directors and shareholders of early and substantial success that the additional capital required has been promptly and fully subscribed. The eastern ground is highly spoken of.—32, Fleet-street, E.C., April 2. R. TREDINNICK, Consulting Mining Engineer.

#### OUR RAILWAY INTERESTS.

SIR,—The progress of our railways is both sound and expansive, while the future is fraught with lively interest and promise. The latest returns are for the year 1872, compiled by Capt. Tyler. The statements are succinct, and the statistics terse, clear, and comprehensive. At the close of 1872 we had 15,814 miles of railways open and in operation, showing an increase of 203 miles during the year. During the three years 1870 to 1872 Parliament had authorised the construction of over 1100 miles in addition. Of the iron roads already open and in use 8512 miles are double, or more, rails, and 7302 single lines of rails. The number of locomotive engines in use was 10,933. Vehicles, exclusive of the former, 337,899. The locomotives average 1 to every 1½ mile of our iron highways, with 21 vehicles to the mile. These figures do not include the engines and wagons of traders and companies acting irrespective of the railway companies. The grand total of capital raised by railway companies is over 569,000,000*l.*, showing an increase during the year of 16,367,000*l.* The average expenditure per mile of the railways open is 35,984*l.*, an increase of 1878*l.* per mile over the year 1870. This additional cost is attributable to expansion in width of lines, a greater number of rails being required to carry on the traffic. Thus the capacity is increased, while the mileage remains unchanged, so likewise on sidings, stations, and rolling-stock. The latter alone was increased during the year in locomotive engines 443, and vehicles 26,472.

The ordinary capital stock and shares amount to 42 per cent. of the gross subscription, and the average interest paid was 5-14 per cent. Debenture stock 15 per cent., and debenture loans 12 per cent. Guaranteed and preferential stock amount to 31 per cent., making up the grand total to 569,000,000*l.* The latter three average dividends of 4-39 per cent. Thus we see that the average interest on ordinary stock exceeds that of debenture and preferred by no less than 0-75 per cent., that being the difference between 5-14 and 4-39 per cent. It may be added, however, that no interest whatever

was paid on 9,207,000*l.* preference stock, and about 33,000,000*l.* of ordinary stock, either from portions of lines not being in actual use or from financial depression and other causes.

The passenger receipts rose during the year, when compared with the former one, from 20,623,000*l.* to 22,257,000*l.*, and the goods receipt advanced from 26,435,000*l.* to 29,017,000*l.* The total revenue per mile being 2786*l.* in 1870, and 3244*l.* in 1872. The cost of working, however, increased from 1357*l.* in 1870 to 1622*l.* in 1872 per mile, the additional cost of fuel being fully ½*l.* per train mile in the latter year over that of 1871. As nearly as possible one-half of the gross receipts are expended in earning them, and a similar result will probably be shown for 1873, though probably the year 1874 will compare more favourably. All our railways are paying dividends exclusive of those referred to, and which amount to slightly under 7½ per cent. of the 15,814 miles open for traffic.

That the iron roads of Great Britain are a *bona fide*, legitimate, and prosperous investment all must admit. There are unquestionably degrees of merits and judgment required in the selection of particular lines over others, but, on the whole, they present a solidity and compactness that render them only second to Consols, East India and Board of Trade securities, while joint-stock banks, foreign bonds, and most of our colonial loans must give them the preference as desirable mediums for the employment of capital.

32, Fleet-street, March 30.

R. TREDINNICK,  
Consulting Mining Engineer.

#### ON LEAD AND ZINC MINING IN AND NEAR WADEBRIDGE DISTRICT.

SIR,—Having received many letters of thanks for my letter on lead and zinc mining in the St. Teath district, I am requested to further notice the district west, from Wadebridge river to Truro river, and from Padstow, north, to Wheal Golden, west, and south within 4 miles of the granite formation. This district has produced many valuable lead mines during my time. Old Shepherds about the first, then Garas, East Rose, Hobblings, Penhale, in the sands. Golden yielded a deal of lead but was badly worked; I am not aware that it ever paid a fair dividend. West Chiverton has been a paying mine. Budnick, and many others produced a deal of lead, but I am not aware that they paid any dividends worthy of notice. I might name 20 other mines that have yielded large quantities of lead, but have not paid much in dividends. Then, the ground east from those mines has shown lead in over 20 places, but are not worked to any notable depth. Penhale Mine, St. Issey, yielded a deal of lead, and is not now above 20 or 30 fms. deep, and is most likely, like Old Treburgett, stopped in a hard bar of ground, and got condemned. Then, Mr. Nicholas has a second mine near that, producing lead in a good layer of rock, but very little has been done on it. Then, Lagosick, if well managed, should have paid dividends from lead, copper, and zinc, but it was worked very badly. Then, there are several mines situate between Padstow and Wheal Golden, that have raised lead, copper, and zinc shallow, but it is not the layer of rock to bear paying copper. It is a good sign to find copper in these lodes; it tends to show that they are master lodes that go down; the copper found in them is only what has passed up from the copper-bearing rock and lodes in layers below, just as tin comes up from granite into the copper layer of slate, and as lead goes up from the lead layers into lime rock. I will, when I have a little time on hand, sketch a section of these layers, showing how they stand to each other. I can say no more now as to the lead mines opened in this district, it is quite enough to show that lead lives and grows in it to perfection, and that it is worth mining in for lead.

I will now allude to opening out mines in a new district. I ever contend that finding a lode is too often found to empty the adventurers' pockets. The only thing to be done on finding a lode is to ascertain its character: is it large, has it a gossan back, does it contain ore, what is its direction? If it shows all these points satisfactorily, it is not far off a cross lode, or some other intersection, that caused a chemical action to take place in it below. To work new mines, I have to again notice that Cornwall has but a few good practical miners who are on the look out for a captain's jacket, but I know that there are scores of cross lodes in Cornwall and Devon many of which carry their heads east of north, and they are lead-bearing lodes. But few lodes pay without they are crossed by east and west lodes. If two of these lodes, running in the same direction, get near they are ever attempting to cross each other. Then they are mostly productive of ore. If they happen to be thwarted by a north and south one at this point, it is all but a certainty that they will become very productive. If a fair sized lode is found, commonly called a north and south lode, but whose true bearing is east of north a few degrees, and a second lode meets it, even running west of north, they will run together for some time, and make ore until they cross each other; when they part they soon lose their ore. Then, I say trench the ground, find these points, mine on them, and leave the single lodes for them who come after.

I have next to call the attention of the illiterate or would-be miners to the ground that I name, first noticing the western portion. All really practical miners know that Cornwall has numbers of east and west lodes between the Consolidated Mines, south, and the St. George, north, and these will not bear copper to pay in the lead district I have here named. The lead layers are too thick on them, but the lode continues on, all the master lodes passing east and up through all the lead-bearing layers. These lodes all appear again south in the granite rock. Then, most mining men are aware that the cross lodes before named are to be seen in these north cliffs as numerous as they are further down in the copper and tin bearing layers. Then, I need not tell them that they all intersect each other in the lead-bearing rock, as they do in the copper and tin bearing, and I am inclined to think they are equally as productive. Then, to me the place to mine for lead is at and where these east and west lodes meet. If it so happen that two of either of these lodes meet each other near a crossing, the chance is all the better. Then, I have to call attention to the so-called north and south ones, which run right—say, a little east of north—and have been very productive. Then they should be followed each way, to see their point of meeting, and the effect on other east and west lodes. I might venture to say that every east and west lode in the western district, when in the lead-bearing layer, will produce lead against the right bearing cross lode, and some of them against even the wrong bearing ones, and they are all a fair speculation in the right places. See the number of Chivertons that have been worked, and what have they done but emptied every shareholder's pocket who ventured in them. I have a name for condemning mines: had I seen all of the Chivertons it is not unlikely I should have condemned 15 out of 20, and that would not be enough.

I next take the eastern portion of the ground I have named, where lodes are not so plentiful as in the western portion. The lead layer is there far thicker, and it is only the strong lodes that have come through. The western copper lodes are known to throw off branches even in the copper layers. The original lode comes up through, but many of these offshoots never come up through in the lead layer, but these main points are more likely to make lead, and every lode of them should be, and will be, opened on; if not by the present it will be by the future rising men, and are more likely to pay them than what we are now working pay us in the way we work, with difficulty making 1 out of 20 profitable. We have a mass of theorists to contend with, men who, like the Callington man, say ores do not grow, but were placed in the earth at the time of the Creation, and "where it is, there it is." Of late a few do acknowledge it to be necessary to mine on a lode to guide them to the El Dorado.

I may notice that the price of lead has kept up well, and is selling at even 2*l.* per ton above the usual price. It is this ore that will now remunerate the English miner. I hope it will continue so. I am no advocate for sending so many of our miners abroad. The world is large, and we know not what they may find; hitherto they have made no particularly great find of lead.

When I worked at Treburgett, 50 years since, there was a great find of lead in Spain, and we had to sell our lead at 12*l.* and 14*l.* per ton; that lead now makes over 30*l.* per ton. We then paid good dividends: even when I left it was paying dividends. Under any circumstances, the home English miners have now to look to lead as the remunerative ore, not only in Cornwall and Devon, but in

every county that has the lead-bearing rock, whether in clay-slate or in the treacherous lime formation. I may here say I never found a lode that produced a ton of solid lead near the surface but should be tried in depth to see what produced it.

In conclusion, I may notice that the majority of England's best miners have emigrated; and from what I have seen, I think they will find ore shallow, and bring it to England cheaper than we can raise it during the next ten years. N. ENNOR.

St. Teath, Cornwall, March 31.

#### AGENTS' AND MINERS' PAY—THIRTEEN-MONTHS SYSTEM.

SIR,—It seems quite evident that whatever attempts may be made by those interested in mines to reorganise, in order to induce the miners to return to the five-weeks system again, will prove futile, as it appears, from the result of meetings recently held amongst themselves, they are decidedly and determinedly opposed to conform to the old system, and predicts an inveterate hatred to its re-adoption. I think a more favourable mode of procedure in which they would adhere to is similar to the decision agreed to at the last survey at the Phoenix Mines, by reducing the former rate of wages to a more proportionate amount, which appears to give greater satisfaction both to the agents, miners, and others employed at the mines. The same plan should be adopted at the South Caradon and other mines in this district, by making a general reduction amongst the staff of agents' pay, as well as the miners, especially managers, who are now receiving the greatest salaries by the present four-weeks system. Why not give them a fixed annual salary? This, with other incidental expenses, would effect a great saving in this department only. It is time that every economy and necessary reduction should be made during the present depression, so as to lessen the current expenditure as much as possible, which would be more consolatory, and afford some encouragement to shareholders, who now experience a fearful sacrifice of their money vested in mining. A SHAREHOLDER.

Liskeard, April 2.

#### MINERS' WAGES—THIRTEEN-MONTHS PAY SYSTEM.

SIR,—I did not intend to trouble you with another reference on this subject, but as my letter has been inadvertently upon I cannot forbear in again asserting that I believe this un-English system of pay is not only damaging mining investments, but is producing a growing want of confidence, for the reasons already adduced by your correspondents for the past few weeks. These reasons, upon just examination, are irrefutable.

Does your Camborne correspondent want to continue a misty mode of payment which has failed to give satisfaction to shareholders, and whereby they are to be bamboozled in not having the accounts of mines brought up to fixed calendar monthly dates, as in every respectable commercial and mercantile enterprise in the world? Is Cornish mining to be exempt from the same sound policy, and is it proper to pursue a principle antagonistic to investors and contrary to the recognised usages of rendering accounts? In fact, is mining to become a greater reproach than ever, instead of efforts being made to create and promote confidence? Are the agents and miners to be considered only, and that at the expense of capitalists? These are questions that cannot be contravened.

If the four-five weeks month in the year be "hated and detested" (to use your correspondent's own words), the thirteen-months pay is a thousand times more to be detested. No argument that can be advanced can justify it, and anyone that promotes it, to my mind, cannot have the just interest of capitalists at heart; and, moreover, I believe in the long run this system, if permitted to continue, would prove to be an indirect injustice to miners and others who are employed, as being prejudicial to their permanent interests.

Capitalists require justice and consideration as well as agents and miners; unless these are properly regarded no good can result in the general interests of all concerned. Besides, impartial agents have condemned the thirteen pays as being both inconvenient and expensive. It has proved so in the mines I have an interest in, and I believe must be the case in every other instance; and, moreover, I assert that it is not in the power of anyone honestly to prove it to be to the contrary, and if the principle of just economy is not regarded how is it possible that mines can be made to pay? Take, for example, all agents, officers, clerks, servants, and others who are regularly engaged in mercantile, professional, domestic, and other establishments by the week, month, quarter, or year. Suppose that they were to turn round and say there are thirteen months in the year, demanding an extra month's pay (as lately gained by the Cornish agents, on the pretext that the four-five weeks month in the year was oppressive to the miner, and overlooking that subsist was advanced where needed), what a system of Babel would crop into the administration of accounts were this to be the case. Would not this be a "hated and detested" policy, and does it not prove the full meaning of the word "absurd," which your correspondent complains of "Auditor" for using, and enquires the meaning of?

The subject, in fact, don't bear reflection, and no argument can make it palatable. I am quite certain of one thing, that respectable mining agents are content to get the value of their services by twelve pays in the year, without stooping to a subterfuge to obtain it by a thirteenth pay. The latter is a contemptible proceeding, and suggestive of many unpleasing motives. Nothing short of rendering accounts upon a calendar monthly basis can give proper satisfaction, nor is any other principle justifiable, and, therefore, the thirteenth pay should be cheerfully abolished. It has been tried, and is justly to be "hated and detested."

I am free to confess that I don't like the four five-weeks in the year system; if some other plan could be devised for calendar monthly pays, and, if practicable, I should prefer a fixed date, each month to terminate the pay, but this would involve a shifting payday. I believe this course would prove the proper compromise to meet the difficulty on all sides. For example, fix the date for the 28th of each month, and if that date falls on Sunday or Monday the pay to take place on the Saturday previous. This plan will dispose of the four five-weeks in the year, as well as be a deliverance from the hazy and unsatisfactory thirteenth pay.

The pay-sheets should be made up as follows:—Day, weekly, and time men, so many days, entered each month, at per day; therefore, if so entered, it cannot matter to these men if paid every 25 or 30 days. Miners and others working by bargain or contract would have their work measured and charged for the work done in any case. Agents, pursers, secretaries, clerks, and others engaged by the month or year entered accordingly.

This plan will not make the miners' children shoeless, or drive the miners into County Courts. Justice would be thus secured to the shareholder, agent, and miner. UNITY.

April 2.

#### LEGITIMATE MINING.

SIR,—Even those who differ from many of Mr. Ennor's opinions on mining must allow that his remarks on spurious mines are most useful. Allow me to place before investors an almost certain rule to distinguish the true from the spurious. It is simply this:—When the prospectus of a new concern is before you have nothing to do with it until you thoroughly know the antecedents of all the directors. Then, mean, of course, of what mines or other companies they have been directors. If only one of these mines have been mismanaged have nothing to do with the company in the prospectus. I have tried this plan for the last 12 years, and found it answer admirably. But how to discover their antecedents? Simply in this way:—Whenever you read of a mining or other company wound up long time management, make a list of the names of the directors. You will not have long to wait, for in a few months you will see all or nearly all reappear as directors of mines, collieries, brick works, peat fuel concerns, &c. But forewarned, forearmed, and with such a list before you, none need be deceived. EXPERTO CADO.

#### THE COURT GRANGE SILVER-LEAD MINES COMPANY.

SIR,—I am instructed by the directors to state that the following letter has been received from Mr. J. V. Clarke, the chairman of the company, dated 20th inst.:—"To-day I went over Court Grange, and I must say that I am exceedingly pleased with our prospects. So far as we have gone in with the pumping the statements as to power and value of the lode taken away are fully borne out. At the end of the adit the lode is more good—in some stops not taken down—and I think we have there many fathoms to take away of most excellent ore, of which I have taken samples. The tramways are in good condition, and for some 50 fathoms in the apparently a run of ore in the sole, which, should it be found of equal value in the roof of the 16 fm. level, will give us ore for the floors for the next 18 months of the most profitable description, as the old company left behind them large quantities of ore, owing to the imperfect nature of their dressing machinery. In the course of the month we shall be driving in this end, continuing the level driven by Mr. Fell for so many years to intersect the bunch of ore in the eastern grounds (the







ceedingly hard. Good progress is being made in the sinking of San Carlos shaft below the 30. The lodes in the winzes are estimated as follows:—Meguel winze, sinking below the 45, 1 ton per fathom. Caro's winze, sinking below the 75 fathom level,  $\frac{1}{2}$  ton per fathom. Alvarez's winze, sinking below the 75, no value. Lucio's winze, sinking below the 20 fathom level,  $\frac{1}{2}$  ton per fathom. Fernandez winze, sinking below the 20 fathom level,  $\frac{1}{2}$  ton per fathom. Melchor's winze, sinking below the 20 fathom level,  $\frac{1}{2}$  ton per fathom.

## FOREIGN MINES.

**PICK EXCAVATOR AND ELEVATOR.**—A pick excavator and discharging elevator, invented by Mr. R. STONE, of Liverpool, consists of a circular disc or discs, which are carried on a shaft mounted in suitable bearings carried on a truck or wheeled frame. The disc or discs are so mounted that they will revolve freely upon suitable power being applied. The discs are fitted with radial slots or guides: in these slots or guides are sliding weights, or metal blocks, so arranged that picks, lolls, or chisels may be screwed or otherwise attached thereto. These weights and picks are so arranged that they fall down the slots or slots in the discs as the discs rotate, the picks projecting beyond the surface of the discs sufficiently to wheel upon the material requiring loosening. Carried on the same truck or wheeled framework, and immediately behind the revolving discs, is an elevator, which lifts the loosened material and discharges the same into a cart or truck, immediately behind the pick excavator. The picks on the disc are so arranged that they will work at banks on road surfaces as may be required; also the picks are so arranged that they can be removed for sharpening by merely unscrewing or detaching the same from the weights. The apparatus is driven by a suitable system of cog-wheels, or straps and pulleys.



## FOREIGN MINING AND METALLURGY.

With the exception of rails and plates, iron has been generally neglected in Belgium, and the state of the market remains comparatively unsatisfactory. The intelligence which reaches us from various points indicates, nevertheless, a certain revival in affairs, especially in the Liège basin, and there are hopes that the low price of pig, coupled with the comparative cheapness of combustibles, will overcome the sluggishness which now characterises the demand, and restore some little activity to the Belgian producing centres. Pig remains feeble, in consequence of the prices prevailing in the Grand Duchy of Luxembourg, where stocks are accumulating from day to day, and where offers are made for the conclusion of considerable contracts at 3/4 0s. 5d. to 3/4 0s. 10d. per ton. Plates remain firm in Belgium, but all other descriptions of rolled iron are supported rather feebly. The Charleroi United Collieries Company will pay, May 1, a dividend for 1873 at the rate of 16s. per share.

The French iron trade remains without animation; most of the works are simply completing contracts of no great importance. Nevertheless, the commercial horizon appears to be clearing up a little, and there are hopes of better times. This feeling imparts firmness to iron quotations, which remain without variation. Pig, on the other hand, has continued to fall to the level prevailing in neighbouring countries. At St. Dizier refining pig is at 5/4 8s. per ton. English pig is quoted at 4/4 17s. 3d. per ton in the French Channel ports. In the Meurthe-et-Moselle selling conditions are purely nominal. At Paris merchants' iron has been quoted at 10/4 per ton, and construction plates at 12/4 8s. to 12/4 16s. per ton. The firm of Royer Houzelet, Guillemin and Co. is to be converted into a company under the name of the Marnaval Forges Company; the capital is to be carried to 80,000/4, but the management will generally remain unchanged. The Firminy Steelworks Company has received from the Paris, Lyons, and Mediterranean Railway Company an order for 5000 tons of cast-steel rails, to be delivered during the current year at 15/4 8s. per ton at the works. It appears that the imports of iron, pig, and steel of all descriptions into France fell off in the first two months of this year to the extent of 18,032 tons as compared with the corresponding period of 1873; the exports of iron, pig, and steel from France also declined 1629 tons in the first two months of this year, as compared with the corresponding period of 1873. Including 5816 tons of rails purchased by the Lille and Valenciennes and the Bouches-du-Rhône Railway Companies, it is calculated that the total consumption of rails in France last year was 194,631 tons; in this total iron rails figured for 130,533 tons.

The French National Assembly, after having voted a tax on railway goods traffic, has rejected a proposal made by MM. Aclouque and Palotte for the exemption from the tax of coal and coke, and the collection in lieu thereof of 2/4d. per ton on coal extracted from the French soil. MM. Aclouque and Palotte also proposed to increase the Customs duties levied on coal and coke to the extent of 2/4d. per ton on coal and 5/4d. per ton on coke. The Budget Commission accepted some time since the proposed exemption from the new tax without admitting the compensation suggested, which would have been a great relief for industry. The circumstances of the last few days show that the new tax has been voted reluctantly, and that it would have been easy to introduce notable mitigations, if amendments of a practical character had been proposed. A decree of the President of the Republic modifies, in the interest of the Treasury, the regulations in force with reference to the payment of the rent imposed on mineral workings. The amount of this rent is now fixed by a valuation committee, but the decisions of this body being generally found to be too favourable for rent-payers, the State proposes to reserve to itself the right of final judgment in future. The State also proposes to refuse in certain cases to rent-payers the right of making their payments by instalments. The aspect of the Paris coal market is so fixed and invariable that it may almost be said to be stereotyped. The general depression prevailing in Parisian trade has made its adverse influence felt, but prices have experienced no further change. In the basins of the Nord and the Pas-de-Calais the fall in prices has become more decided, because stocks have increased.

The sale of coal exhibits some weakness in Belgium; the number of transactions is also limited, and there is a marked scarcity of important contracts; nevertheless it may be said that the hopes of coalowners are slightly reviving, and not altogether, perhaps, without reason. At the rates now prevailing for coal many observers begin to anticipate a probable check in the downward tendency of prices. It is doubtful, however, whether numerous oscillations will not yet be witnessed in quotations. The late advance in prices was too sharp, and the fall which has now set in will probably be too sharp also; this law of action and reaction will be found in all the variations which have taken place in the price of coal since 1840. Wages have been almost everywhere materially reduced, and they are now only about 10 to 15 per cent. above the point at which they stood before the late advance. The prices now current are, accordingly, still remunerative, and if there were a free sale for the coal raised no one would have any right to complain. Unfortunately, however, the demand remains feeble, notwithstanding all the concessions made, and stocks do not diminish, notwithstanding the very great reduction which has taken place in the extraction. With regard to this reduction, it is calculated that the production of the Mons basin is now one-third less than it formerly was. In the Charleroi and Liège basins several descriptions of coal have been reduced 1s. 8d. per ton. The most active demand just at present prevails for sugarworks.

The Paris copper market has remained without animation, and quotations have slightly declined for all descriptions. At Havre, Chilean bars have made 82/4; ditto in ingots, 87/4; tough English, 87/4; and Corocoro minerals, pure standard, 84/4 per ton. Upon the Havre copper market the tendency of affairs has been feeble. At Marseilles quotations for copper have also been tending downwards. In Germany the state of affairs has scarcely changed; the requirements of consumption seem likely to increase, but still prices have lacked firmness. Transactions in tin have been generally quiet at Paris, and prices have exhibited a downward tendency. Banca, delivered at Havre or Paris, has brought 105/4; Straits, 99/4; and English, delivered at Havre or Rouen, 20/4 per ton. Tin has been neglected to a great extent upon the Marseilles market, and prices have been nominal. At Rotterdam, Banca has been dealt in at 57/4 to 58/4. At the sale of the Society of Commerce, just held, the average price realised was 55/4 3s. for Banca, and 55/4 5s. for Billiton. Since then Banca has fallen to 54/4, and Billiton to 53/4; these prices have, however, brought many speculators back to the market, and some important transactions have taken place. The German tin markets have been distinguished by great scarcity of transactions, and considerable irregularity in prices. At Paris, French lead, delivered at Paris, has made 21/4 12s.; Spanish, delivered at Havre, 22/4; English ditto, 22/4; and Belgian and German, delivered at Paris, 21/4 16s. per ton. The Marseilles market, which formerly controlled to some extent the price of lead, has now become completely inactive. The German lead markets have remained without change. The state of the Paris zinc market has not improved, notwithstanding the return of spring.

THE GREATEST MINE IN THE WORLD—TEN MILLIONS AND A HALF IN ONE YEAR.—The Belcher Mine, on the Comstock Lode, Nevada, is without doubt the greatest bullion-producing mine in the world. It has produced in the last two and a half years the immense sum of \$16,772,965. In 1873 it produced \$10,779,171, and being carried forward, the mine contains 1040 ft., divided into 104,000 shares. The first bullion produced was in 1864, at which time it paid a dividend at the rate of \$21 per foot, or 21 c. per share on the present issue. In July, August, and December of that year dividends of \$24 per foot were paid. In January, 1865, the mine paid \$51 per foot. \$30 in February, \$75 in March, \$75 in April, and \$21 in May. Within a year nine advances were paid, aggregating \$421,200. From that time until April, 1871, assessments were made to work the mine. There were 21 assessments, aggregating \$660,400. At that time the assessments were \$239,300 in excess of

the dividends. During these seven years of unproductiveness the mine was continually worked, though at times the stock sold for less than the delinquent assessment. In October, 1870, shares were sold as low as what would be equal to 10 c. per share of the present issue. As the ore developments improved the mine, of course, increased in value to a wonderful extent. The mine has paid dividends regularly since January, 1872. This mine has no parallel in the world, the Crown Point, adjoining it, being the only one approaching it in richness. The mine produced in two and a half years nearly \$17,000,000, and since its opening has paid nearly \$10,000,000 as dividends above all assessments. The success of this and the Crown Point has encouraged mine owners on the whole Comstock to pursue developments at greater depths. The circumstances connected with the development of the Belcher into a first-class mine furnish an example for other mines in similar circumstances. After their ore gave out they worked systematically and uninterruptedly until they developed the largest ledge ever opened in any mine in the world.

MONEY IN CIRCULATION.—Gold coin in circulation, 105 millions; silver and copper coin, 18 millions. Bank of England issue—notes issued, 37,600,000/4; notes in reserve, 11,900,000/4; notes in circulation, 25,700,000/4. Country issue—notes authorised, 15,800,000/4; notes in circulation, 12,800,000/4. Total circulation, 161,500,000/4. The stock of gold held in the Issue Department of the Bank, represented in circulation by the equivalent of notes, makes the total

amount of gold now in the possession of the country as money equal to 127,600,000/4, so that, including the 18 millions of silver and copper coin, the mediums of exchange at present active in the country may be said to consist of 145,600,000/4 metallic money, and 15,900,000/4 of credit money; total, 161,500,000/4; there being in reserve—that is, not in active use—14,900,000/4 of credit money.

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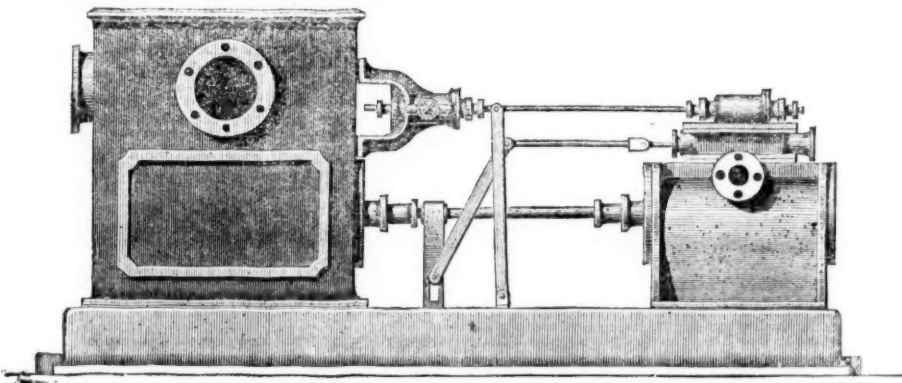
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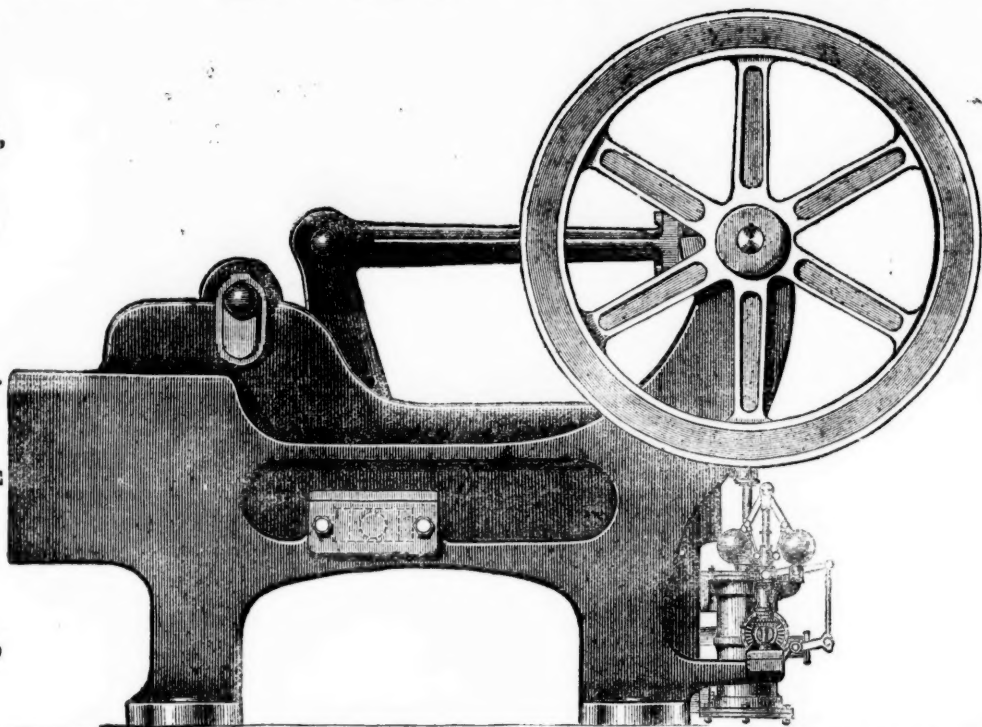
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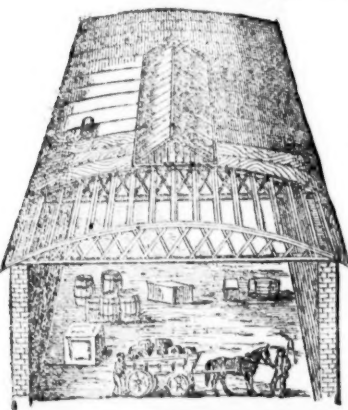
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